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EMBRYOLOGY.<sup>1</sup>**Development of the Scyphostoma of the Scyphomedusæ.**

—Professor C. Claus has published a paper dealing with the early stages of the embryo and the structure of the scyphostoma of *Cotylorhiza*, *Aurelia*, and *Chrysaora*.<sup>2</sup> The paper is largely a detailed criticism of Goette's work on the same subject, and a vindication of Claus's preceding paper, especially on those points in which Goette differed from him. The discovery of the ectodermal origin of the four muscle-bands of the scyphostoma would seem to be the only new point of value added by Goette. The others were either pointed out by Claus in his former paper, or else are now shown to be erroneous. Goette described the endoderm in *Aurelia* as arising from cells wandering from the blastula into the segmentation-cavity, where they united into a solid plug, attached at one joint to the wall of the blastula. Later a cavity arises in the middle of the mass, and this communicates with the exterior by means of a blastopore. Claus denies this method of formation of the endoderm. Exceptionally, he says, wandering, isolated cells are found in the segmentation cavity of *Aurelia*, but the large mass of cells pushes in from the endoderm pole. The two or three cells which may arise elsewhere from the blastoderm take no part in the formation of the permanent endoderm, and seem to degenerate. In *Cotylorhiza* the gastrula arises by invagination.

Goette's statement that the lining of the proboscis is formed by an ectodermal invagination is verified, but there is not formed an œsophagus like that of the Actinians in the Scyphomedusæ, as Goette affirmed. In contradistinction to the Hydropolyp, the Scyphopolyp has not only the ectodermal lining of the proboscis, but is also characterized by four evaginations from the part of the stomach-cavity, which go to form the interior of the tentacles, and there alternating with the tænioles. The four septal muscles arise from ectodermal ingrowths from the peristome, differing in this from the Anthozoa. The sense-organs arise from the bases of the eight radial tentacles.

Goette has denied that the polyp and jelly-fish in the Scyphomedusæ are to be regarded as forming an alternation of generations. Claus shows, however, that to deny the traditional alternation of generations in Scyphomedusæ consists merely in giving a narrow meaning to

<sup>1</sup> Edited by Dr. T. H. Morgan, Johns Hopkins University, Baltimore, Md.

<sup>2</sup> Arb. Zool. Inst. Wien., T. IX., H. 1.

the terms themselves, and that, properly speaking, the process found in the group is clearly to be regarded as a true alternation of asexual generations.

**Body-Cavities of *Paludina vivipara*.**—A short preliminary notice is published in the *Zool. Anzeiger* for February 23d, by R. v. Erlanger, on the "Development of *Paludina vivipara*." The description of the origin of the body-cavities is interesting. The gastrula arises by invagination. "Soon the archenteron pushes out (aus stülpt sich) at the sides and ventrally, so that one sees in side-view of the embryo two sacs (Schläuche), one long dorsal, one the archenteron, and a shorter ventral one the cœlom sac. Soon the cœlom sac pinches off from the archenteron, and surrounds it ventrally and at the sides. In course of development the mesoderm cells (which before formed a mass with the cells in close contact) separate more from each other, forming a parietal and visceral layer, at the same time growing around the archenteron dorsally. Lastly, the mesoderm breaks up into the characteristic spindle-cells which run irregularly through the body-cavity. In the meantime the œsophagus arises by invagination of the ectoderm, and connects with the archenteron, while the gastrula mouth (blastopore, Urmund), as is known, is converted into the anus. At this stage the mesoderm collects ventrally in the archenteron, not far from the hinder end of the body, in two cell-masses, and in these soon a lumen appears. The sacs so formed press together in the ventral mid-line until they fuse with one another and fuse into a single mass, whose paired origin is for a long time indicated by a middle septum. In this way is formed the sac of the pericardium."